

## **REMARKS**

### **The Amendments**

Claim 1 is amended to clarify the location of the "volume surmounting the plate," i.e., it is the volume above the plate and below the lowest level of said lateral orifices. It is in this volume that the liquid collects. The claims are further amended to correct minor informalities, including putting the "use" claims in method form, and to address antecedent basis issues. The amendments do not narrow the scope of the claims since they merely clarify the original intent inherent in the original claims. The amendments should not be interpreted as an acquiescence to any objection or rejection made in this application.

To the extent that the amendments avoid the prior art or for other reasons related to patentability, competitors are warned that the amendments are not intended to and do not limit the scope of equivalents which may be asserted on subject matter outside the literal scope of any patented claims but not anticipated or rendered obvious by the prior art or otherwise unpatentable to applicants. Applicants reserve the right to file one or more continuing and/or divisional applications directed to any subject matter disclosed in the application which has been canceled by any of the above amendments.

### **The Rejection under 35 U.S.C. §101**

The rejection of claims 18-20 under 35 U.S.C. §101 is believed to be rendered moot by the above amendments wherein these "use" claims are rewritten as method claims.

### **The Rejections under 35 U.S.C. §102**

The rejections of claims 1-8 under 35 U.S.C. §102(b), as being anticipated by Boyer (US Pub. 2002/0020359) or Boyer (US Pub. 2002/0021991) are respectfully traversed.

Boyer '359 discloses a device for injecting a secondary fluid between two successive granular beds to produce a polyphase mixture of the secondary fluid with the fluid or mixture of fluids from the upper granular bed. The secondary fluid is injected into a chamber provided in a space between the two beds. Boyer '359 describes two embodiments in Figures 3 and 4. In each

embodiment, the secondary fluid being injected is a gas, i.e., a light fluid; see, e.g., page 3, para. [0044] and [0046]. In both embodiments, the gas is injected laterally into a chamber provided horizontally in the device.

Boyer '359 does not disclose or make obvious a device having a "tubular system (50) extending downwardly from above the vertical pipes into the reaction chamber for the introduction of the dense fluid from outside the reaction chamber into a volume surmounting the horizontal plate (62), which volume is above the plate and below the lowest level of said lateral orifices (63), the tubular system having exit slots for the dense fluid that are wholly immersed in the said volume surmounting the plate (62)," (emphasis added) as recited in current claim 1. The device of Boyer '359 does not include any tubular system extending downwardly into the reaction chamber. Further, the chamber elements described in Figures 3 and 4 of Boyer are not for the introduction of a dense fluid but rather for a gas. Further regarding the Figure 3 embodiment, Boyer '359 describes that the secondary fluid (gas) is provided in the chamber, not above it.

Boyer '991, similar to Boyer '359, also provides a chamber for producing a polyphase mixture. The chamber is provided with a pipe for lateral injection of a liquid feed; see Figure 3 and page 3, para. [0043].

The Boyer '991 device does not contain vertical pipes extending above the chamber; the pipes are within the chamber. Further, Boyer '991 does not disclose a "tubular system (50) extending downwardly from above the vertical pipes into the reaction chamber for the introduction of the dense fluid from outside the reaction chamber into a volume surmounting the horizontal plate (62), which volume is above the plate and below the lowest level of said lateral orifices (63), the tubular system having exit slots for the dense fluid that are wholly immersed in the said volume surmounting the plate (62)," (emphasis added) as recited in current claim 1. There is no tubular system extending downwardly to a volume above the plate (assuming without admission that the chamber in Boyer '991 is considered a plate). Also, the dense fluid (i.e., liquid) is not introduced by such a downwardly extending system but rather laterally. Further, there are no vertical pipes extending above such a plate as recited in instant claim 1. The vertical pipes in Boyer '991 are within the chamber and do not extend above it or have orifices which are above any plate.

For all of the above reasons, it is urged that neither of Boyer '359 or Boyer '991 disclose or

suggest the claimed invention. Thus, the rejections under 35 U.S.C. §102 should be withdrawn. Further, these references do not suggest the claimed invention and thus do not render the claimed invention obvious under 35 U.S.C. §103.

### **The Rejection under 35 U.S.C. §103**

The rejection of claims 9-17 under 35 U.S.C. §103, as being obvious over Boyer '991 in combination with Alcock (U.S. Patent No. 3,977,834) is respectfully traversed.

The discussion of Boyer '991 from above is incorporated herein by reference. To summarize, Boyer '991 neither discloses or suggests a device with a tubular system extending downwardly to provide a dense fluid to a volume above a plate nor does it disclose or suggest vertical pipes with perforations extending above such a plate. Alcock was cited for its teachings regarding certain dependent claims, particularly those related to the secondary tubes recited in the dependent claims. These secondary tubes in applicants' claims are in communication with the terminus of the downwardly extending tubular system. Since Boyer '991 neither discloses or suggests such a downwardly extending tubular system for introducing a dense fluid, modification of Boyer '991 by Alcock could not result in or suggest applicants' invention. Further, Alcock's teachings of angled perforations relate to a gas injection means and suggest nothing regarding a tubular system for introducing a dense fluid. Thus, no combination of Boyer '991 with Alcock is believed to provide any suggestion of the instantly claimed invention.

For the above reasons, the rejection under 35 U.S.C. §103 should be withdrawn.

### **The Provisional Obviousness-type Double Patenting Rejections**

The provisional obviousness-type double patenting rejections of claims 1-8 over copending applications, Ser. Nos. 10/024,382 and 10/815,827, are respectfully traversed.

The '382 application is now U.S. Patent No. 7,029,638. The instant claims are not obvious variants of the patent claims of the '638 patent. The independent claim 1 of the patent recites:

"Apparatus comprising a vessel and an injection device having a top and bottom inside said vessel for carrying out separate injection of first and second fluids which are in two different physical states or which are not miscible, and for homogeneous distribution in

the vessel of at least one of the fluids downstream of said device, said device comprising a chamber (5) which is supplied by the first fluid, and which chamber comprises orifices (7, 8) on the bottom of the device for the passage of the first fluid, said device further comprising elongated conduits extending downwardly through said chamber, said conduits being imperforate within said chamber and having free ends at the bottom of the device outside said chamber acting as a passage for the second fluid through said chamber, said apparatus further comprising means for introducing the first fluid into the chamber." (emphasis added)

The patent claims do not claim nor make obvious a device having a "tubular system (50) extending downwardly from above the vertical pipes into the reaction chamber for the introduction of the dense fluid from outside the reaction chamber into a volume surmounting the horizontal plate (62), which volume is above the plate and below the lowest level of said lateral orifices (63), the tubular system having exit slots for the dense fluid that are wholly immersed in the said volume surmounting the plate (62)," as recited in current claim 1. There is no tubular system described or claimed in the '638 patent which would provide for introduction of a fluid in a volume above a horizontal plate. To the extent the chamber (5) in the '638 patent can be considered a plate, no structure is provided to introduce any fluids that are above this plate. Certainly, there is no such tubular structure "extending downwardly from above the vertical pipes into the reaction chamber." The patent describes that the liquid feed (6) is provided in the chamber (5), not above it. Further, the orifices described in patent claim 1 are in the chamber not in vertical pipes above a plate.

The '827 application is not patented, therefore, reply thereto may be premature since the claims may be amended. However, it is believed that the instant claims are distinguished from any device disclosed (and which therefore could be claimed) in the '827 application. The '827 application describes a device requiring:

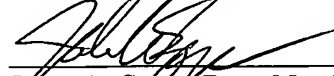
"a substantially vertical inner wall (30) located in the space comprised between the wall of the reactor and the zone occupied by the conduits, and defining with said outer wall an annular zone (28) for receiving at least the liquid phase from outside the reactor and which communicates with the central portion of the plate (20), in particular by means of lower cross sections for flow (32)."

The instantly claimed device does not include an "annular zone (28) for receiving at least the liquid phase from outside the reactor." To the contrary, as discussed above the instant claims recite a "tubular system (50) extending downwardly from above the vertical pipes into the reaction chamber for the introduction of the dense fluid from outside the reaction chamber into a volume surmounting the horizontal plate (62), which volume is above the plate and below the lowest level of said lateral orifices (63), the tubular system having exit slots for the dense fluid that are wholly immersed in the said volume surmounting the plate (62)." The dense fluid is the liquid, thus, the instant claims have a means for introducing the liquid which is distinct from the annular zone of the '827 application invention. There is nothing to suggest these two distinct features are obvious variants of one another.

For the above reasons, it is urged that the obviousness-type double patenting rejections should be withdrawn.

It is submitted that the claims are in condition for allowance. However, the Examiner is kindly invited to contact the undersigned to discuss any unresolved matters. The Commissioner is hereby authorized to charge any fees associated with this response or credit any overpayment to Deposit Account No. 13-3402.

Respectfully submitted,



John A. Sopp, Reg. No. 33,103  
Attorney/Agent for Applicant(s)

MILLEN, WHITE, ZELANO  
& BRANIGAN, P.C.  
Arlington Courthouse Plaza 1, Suite 1400  
2200 Clarendon Boulevard  
Arlington, Virginia 22201  
Telephone: (703) 243-6333  
Facsimile: (703) 243-6410

Attorney Docket No.: PET-2094

Date: July 20, 2006

JAS:blb

K:\PET\2094\reply 72006.doc